MS ELECTRONICS, INC.
8031 CESSNA AVENUE
GAITHERSBURG, MARYLAND 20879
301-921-0200 800-638-8944
IN MD. 800-492-7136

Simpson

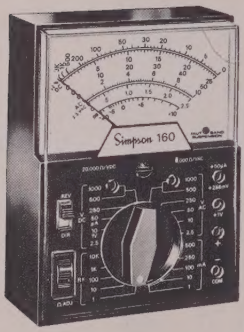
INSTRUMENTS THAT STAY ACCURATE

OPERATOR'S MANUAL

MULTICORDER MODEL 605

SIMPSON ELECTRIC COMPANY
5200 W. Kinzie St., Chicago, Illinois 60644
Area Code 312, Telephone 379-1121
In Canada, Bach-Simpson, Ltd., London, Ontario

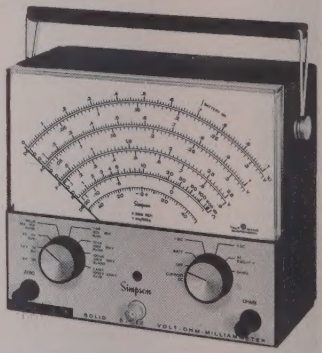
new VOMs from Simpson



160 Handi-VOM

Just 3 5/16" Wide . . .
with Full-Size VOM Features

- 20,000 Ω VDC . . . 5,000 Ω VAC
- ±2% DC . . . ±3% AC
- 5 Resistance Ranges . . . Plus a 0-250 DC Millivolt Range



313 Solid-State VOM

VTVM Features . . . VOM Conveniences

- Uses a single 9-volt battery
- 10 Meg Ω DC . . . 11 Meg Ω AC
- Large 7" scale

Write for bulletin 2080

Simpson has over 1,400 stock sizes and types of panel instruments, too!

Write for bulletin 2081

OPERATOR'S MANUAL

MULTICORDER MODEL 605

SIMPSON ELECTRIC COMPANY

5200 W. Kinzie St., Chicago, Illinois 60644
Area Code 312, Telephone 379-1121
In Canada, Bach-Simpson, Ltd., London, Ontario

Copyright 1971, Simpson Electric Co.
3-71 NMJ HINZ

Printed in U.S.A.
5-113165

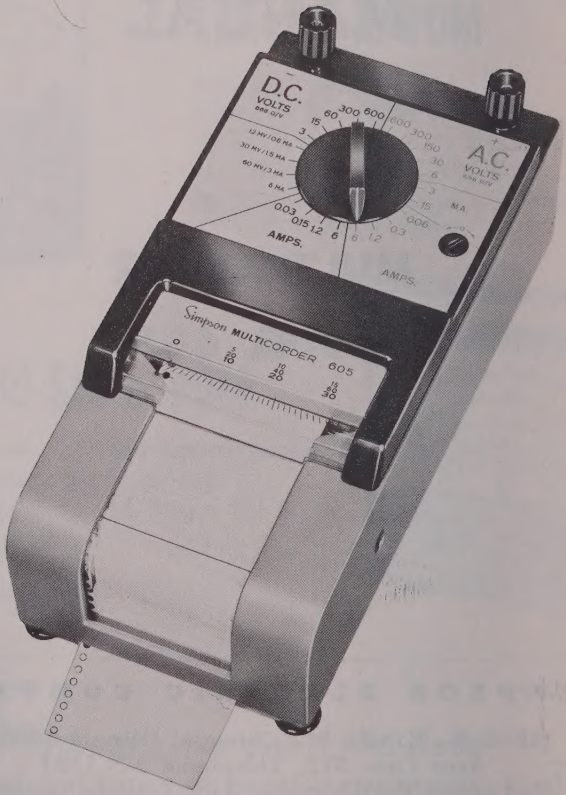


FIG. 1: SIMPSON MULTICORDER – MODEL 605
VOLT-AMP-MILLIAMP-MILLIVOLT RECORDER

TABLE OF CONTENTS

	Page
General Description	4
Measuring Ranges	5
Measuring System Specifications	6
Recording System Specifications	7
Operation	
Inserting Chart Paper	9
Adjustment of Time Scale on Chart	9
Selection of Drive	9
Selection of Chart Speed	10
Gear Unit Exchange	10
General Technical Information on Measurements	11
A.C. Current and Voltage	12
Superimposed D.C. and A.C.	12
Maintenance	13
Accessories	13

ILLUSTRATIONS

Figure 1. Model 605 MULTICORDER	2
Figure 2. Chart Paper	8
Figure 3. Chart Drive	10
Figure 4. Dimensional Diagram	14
Figure 5. Multicorder, Closed	15
Figure 6. Multicorder, Open	16
Figure 7. Schematic Diagram	17

CAUTION!

The Model 605 MULTICORDER is delivered with the chopper bar in locked position. To put into operation for recording, release the locking device of the chopper bar (see Fig. 6).

GENERAL DESCRIPTION

The Model 605 MULTICORDER is an accurate, compact, and easy to operate instrument, combining the advantages of a portable multi-range measuring instrument with those of a recording device.

The Model 605 MULTICORDER is simple and rugged in design, utilizing modern components and techniques, permitting ease of operation. Inkless recording by using fast sequential impressions on pressure sensitive strip chart paper eliminates the problem of pen and ink maintenance, and also permits instant visual observation of measured values. A special device marks the range being measured on the chart paper in addition to the recorded value, thus making a permanent record both of range and measured value.

The Model 605 MULTICORDER, with its built-in transformer is particularly suited to the measurement of electrical characteristics of circuits in the power and process engineering industry. Accurate quantity measurements and permanent recordings of D.C. and A.C. voltages and currents can be made.

The Model 605 MULTICORDER features a high torque meter movement, with a shockproof, taut band suspension moving coil system. Electrical protection of the instrument

is provided by protective diodes and a 6 amp. fuse to aid in preventing excessively high currents from damaging the meter and measuring circuits.

The Model 605 MULTICORDER has a range switch located in the center of the panel. It can be turned in either direction to obtain any desired range and circuit position. Two binding posts are provided which will accept the prods of the test lead set. The binding post are marked (+) and (-) and the test leads are color coded (Red & Black) for easy polarity identification.

MEASURING RANGES

DC – 666 ohms per volt

AC – 666 ohms per volt

DC Voltage		DC Current	
Range	Internal Resist.	Range	Voltage Drop
600 volts	400K ohms	6 amp	0.27 volts
300 volts	200K ohms	1.2 amp	0.10 volts
60 volts	40K ohms	0.15 amp	0.05 volts
15 volts	10K ohms	30 Milliamp	0.05 volts
3 volts	2K ohms	6 Milliamp	0.05 volts
60 Millivolts	20 ohms	3 Milliamp	0.06 volts
30 Millivolts	20 ohms	1.5 Milliamp	0.03 volts
12 Millivolts	20 ohms	0.6 Milliamp	0.012 volts
AC Voltage		**AC Current**	
600 volts	400K ohms	6 amp	0.30 volts
300 volts	200K ohms	1.2 amp	0.06 volts
150 volts	100K ohms	0.3 amp	0.10 volts
30 volts	20K ohms	60 Milliamp	0.02 volts
6 volts	2K ohms	15 Milliamp	0.75 volts
		3 Milliamp	0.25 volts

MEASURING SYSTEM SPECIFICATIONS

The moving coil system, with a taut band suspension movement, has a response time of less than 1.5 seconds. A.C. measurements up to 20,000 Hz are made by means of a full-wave rectifier with germanium diodes.

	percent of full scale
Accuracy of indication:	
D.C.	±1.5
A.C. (sinusoidal A.C. 45 to 65 Hz)	±1.5
Accuracy of recording:	±2.5
Temperature Influence	
D.C. – for 10°C change (18° F)	1 max (% of true value)
A.C. – for 10° C change (18° F)	1 max

(Influence is positive from 0 to 20° C, (32 to 68° F) and negative from 20 to 50° C, (68 to 122° F))

Frequency influence:

1.5% of full scale from 25 to 10,000 Hz.
2.5% of full scale from 15 to 25 Hz and 10,000 to 20,000 Hz.

Influence of Wave Form

Instrument calibrated in effective values of a sinusoidal wave. Form factor of 1.11 for sinusoidal A.C. taken into account. (Deviations from a sine wave may cause an error).

Dielectric Test Voltage:

The instrument is designed to withstand 2000 V.A.C. between the measuring circuitry and any part of the case.

Overload Protection:

The measuring circuits are protected by a 6 ampere fuse (0.2 in. dia. x 1 in. long). (2 spare fuses are included with instrument).

Zero position of pointer can be shifted up to 30% of scale length if negative quantities are to be expected.

RECORDING SYSTEM SPECIFICATIONS

Recorder:

Chart paper and chopper bar action can be driven either by the self-contained synchronous motor or by external driving means. The following types of drive can be selected by appropriate settings of lever II (Fig. 3).

M – Chart drive and chopper bar action by self-contained synchronous motor.

E – Chart drive by external drive, chopper bar action by self-contained synchronous motor.

O – Chart drive and chopper bar by external drive.

Motor Drive:

Self-starting synchronous motor, 115 volts, 60 Hz, contained in recorder. Grounded line cord is provided with recorder.

Chart Speed:

	Chart Speeds	Part Number
Standard gear unit	1/3/12 inch/hour	5-110681
Special fast gear unit	30/60/90 inch/hour	5-110682

Chart impressions are made every two seconds.

Required Data for External Drive:

(See coupling shaft for external drive, Fig. 3, Page 10).

Gear Unit	Standard	Special
Torque; lever in position O	0.7 in-lb. approx.	0.3 in-lb approx.
Torque; lever in position E	0.09 in-lb. approx.	0.1 in-lb approx.
Speed to obtain listed chart speeds	30 rev/hour	2 rev/min
Direction of rotation	Clockwise	

Chart Paper:

Type – Pressure sensitive.

Width of recording – 2.3 inches.

Length of paper on roll – 50 feet approximately.

Divisions – 30.

Range imprint – every 12 inches.

Time imprint – every inch – numbered 1 through 12.

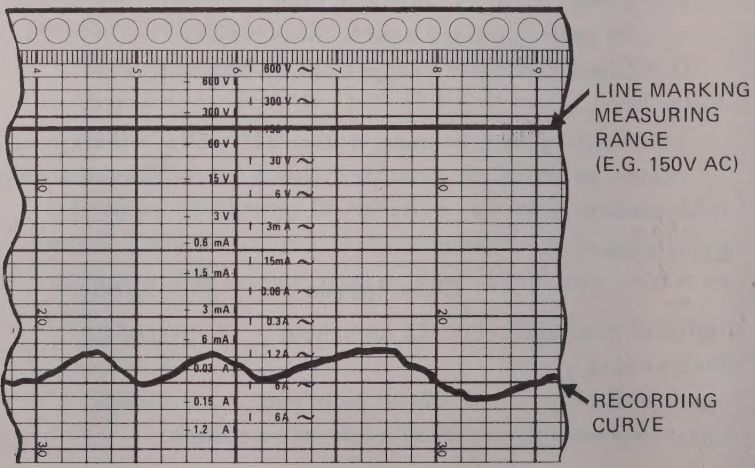


FIG. 2. CHART PAPER

OPERATION

INSERTION OF CHART PAPER (See Fig. 3, page 10 for identification of parts.)

Loosen knurled locking screws on base of instrument, lift hinged upper part; then press down holding catches on both sides of feed spool, lift out feed spool. Install new chart roll with the perforation on the flange side and shift it until it contacts flange. When reinserting feed spool, check correct position (perforations on the left). Pull off about 8 inches of paper from chart roll, pull back chart-guides and insert the chart so that the pins of the drive spool engage the perforations of the paper. Tighten strip by turning knurled flange on feed spool. The chart strip should extend beyond the edge of the base-plate of the instrument for proper operation.

ADJUSTMENT OF TIME SCALE ON CHART

Instrument Opened: Turn knurled wheel of drive spool (see Fig. 3) in the direction of chart-motion until desired time-line coincides with recording edge.

Instrument Closed: Carefully pull out extending end of chart until scale marked "▶—" coincides with that mark "▶" on chart which is positioned before the desired time line.

SELECTION OF DRIVE

Set lever II (see Fig. 3) to "M" position. (When an external drive is used, please follow instructions on page 7.)

SELECTION OF CHART SPEED

Move lever I (see Fig. 3) into slot corresponding to chart speed desired. Three speeds are available with each gear unit.

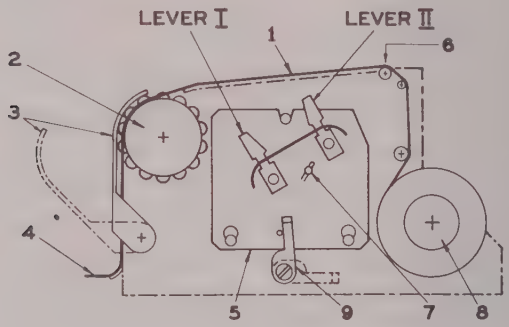


FIG. 3. CHART DRIVE

1. Desk (can be raised on its hinges)
2. Drive spool with knurled wheel
3. Chart guides (closed and pulled back)
4. Chart paper
5. Exchangeable gear unit (before removing, place lever II to position O).
6. Recording edge
7. Coupling shaft for external drive (shaft dia. 0.118 inches; pin dia. 0.040 inches)
8. Feed spool
9. Clamping lever

GEAR UNIT EXCHANGE (Changing Chart Speeds)

(For details on specific chart speeds, see information on Page 7). Engage lever II in the slot marked "O". Then

swivel clamping lever down, which unlocks gear unit. (Refer to Fig. 3). Push down on gear unit so guide pins are free, and pull out to the right. Prior to inserting new gear unit, place lever II in the "O" position. Then insert new unit, properly line up guide pins, and lift up for correct positioning. Finally, return clamping lever to its original position and place lever II into desired operating position. (If necessary, the desk can be raised to aid this operation).

The base has slots allowing permanent mounting. For best accuracy, recorder should be mounted in horizontal position. See Fig. 4 for dimensions.

GENERAL TECHNICAL INFORMATION ON MEASUREMENTS

To achieve maximum accuracy place instrument in a horizontal position, out of strong magnetic fields. Check zero adjustment (see also Measuring System Specifications). For this – and also for use as an indicating instrument – the chopper bar should be put out of operation by moving upward the lever of the locking device (see Fig. 6, page 16).

Connect test leads, set range selector to the voltage or current range desired, and connect to measuring circuit. When in doubt as to the voltage or current present, always use the highest range as a protection to the instrument. Observe meter reading. If the indication is within a lower range, the switch may be set for the lower range to obtain a more accurate reading. To start recording, connect power cord to 115 V. A.C. source.

In current measurements, if possible connect instrument to that conductor which has the lower potential to ground (maximum 650V).

After all measurements are completed, the range selector switch should be returned to the highest voltage range.

A.C. CURRENT AND VOLTAGE MEASUREMENTS UP TO 20,000 HZ

Connect the "minus" terminal of instrument directly to ground if possible, or the point with the lowest potential above ground. In the case of higher frequencies, input capacitance causes a lowering of the internal resistance (R_i).

The input capacitance is about 40 pico-farads.

SUPERIMPOSED DC AND AC MEASUREMENTS

The Model 605 Multicorder with its built-in transformer allows the measurement of superimposed DC and AC components by a current or voltage measurement.

In order to avoid overloading the instrument, the measuring range selected should not be smaller than the DC or AC component to be measured. It is therefore suggested that the DC and AC component should always be measured before switching to the next lower range.

MAINTENANCE

The recorder requires little maintenance. Every 1000 hours, lubrication of the drive bearings with a light oil, such as 3 in 1, or sewing machine oil, is recommended.

Deposits of dust from the chart paper on the scale and the chopper bar should be removed from time to time with a soft brush.

ACCESSORIES

		Part Number
Gear Unit	1/3/12 inch per hour (Std.)	5-110681
Gear Unit	30/60/90 inch per hour	5-110682
Feed Spool		5-110683
Chart Paper	Time scale in inches Available in quantities of 10	02614
Fuse, 6 amp		G0-0-00139
Test Lead Set		7500
Leather Carrying Case		02611

ACCESSORIES (Continued)

		Part Number
Shunt	600-300-120 amps, accuracy 0.5% (60-30-12 Mv) 600A/60 Mv Max.	06529
Shunt	60-30-12 amp, accuracy 0.5% (60-30-12 Mv) 100A/100 Mv Max.	06531
Terminal Lug, for Shunt	(2 Req'd. for external leads)	06532
Current Transformer	Clip on type, (2000:1 turns ratio) 600-120-30 amps A.C. (0.3A-60-15 Ma. A.C.) accuracy ± 3% (45-65 Hz)	02461
Current Transformer	Clip on type, (10,000:1 turns ratio) 600-150-30 amps A.C. (60-15-3 Ma A.C.) accuracy ± 1% (45-65 Hz)	02462

NOTE: Model 605 Recorder is supplied with two rolls of chart paper, one feed spool, one test lead set, and two extra fuses.

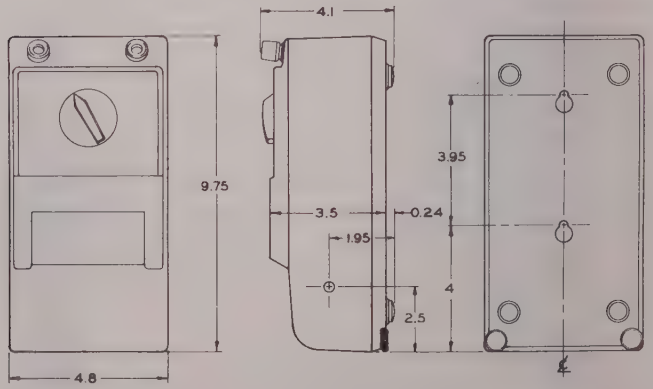


FIG. 4. DIMENSIONAL DIAGRAM; WEIGHT 5.5 LBS.

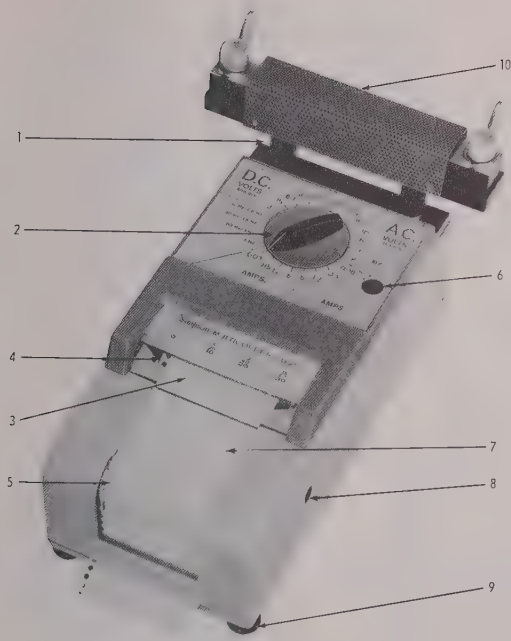


FIG. 5. MULTICORDER, CLOSED

1. Binding Posts
2. Range Selector Switch
3. Scale
4. Pointer
5. Plexiglass Cover
6. Zero-adjustment Screw
7. Writing Desk (for making notes on chart)
8. Opening for external drive
9. Knurled locking screws of case
10. Accessory Shunt

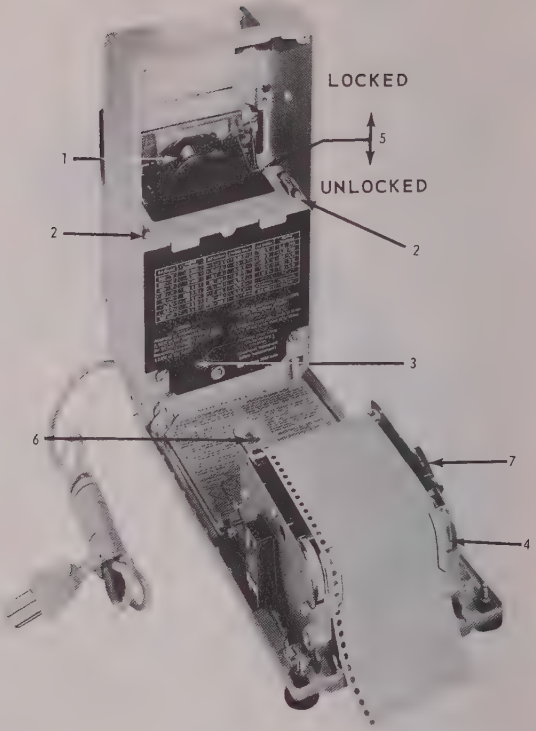


FIG. 6. MULTICORDER, OPEN

1. Taut Band Movement Housing
2. Spare Fuses
3. Fuse Receptacle
4. Chart Guide
5. Locking Device for Chopper Bar
6. Aperture for Mounting Instrument
7. Switch Panel

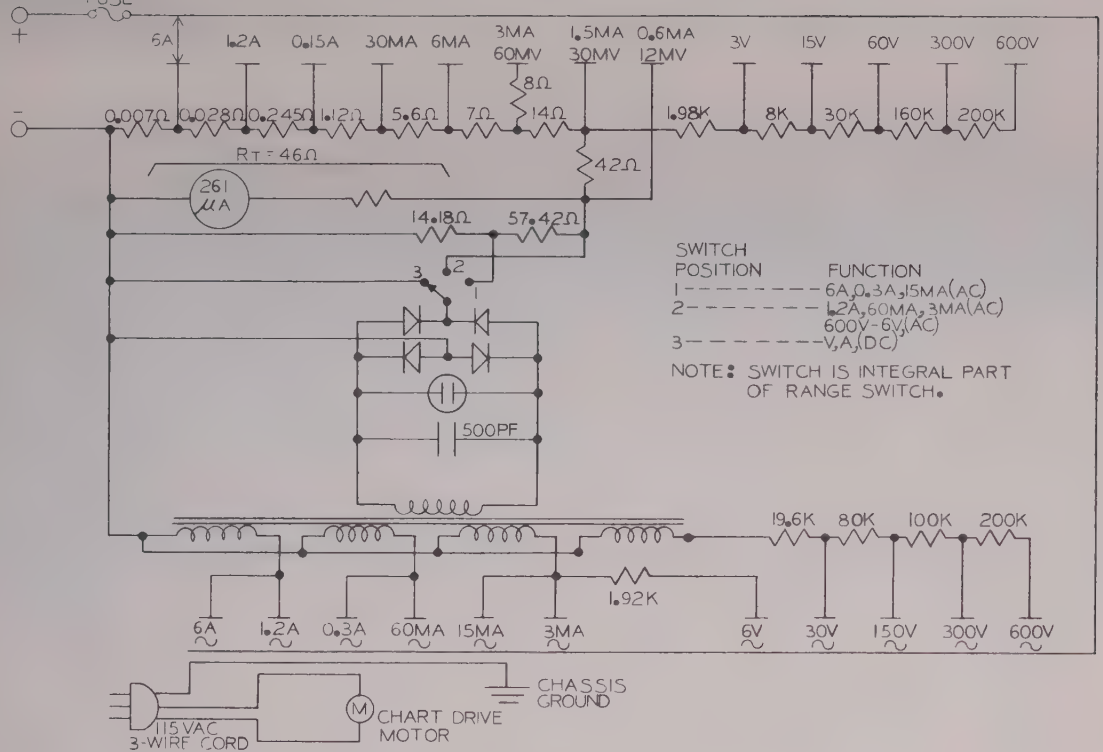


FIG. 7. OVERALL SCHEMATIC, MODEL 605

SIMPSON ELECTRIC COMPANY
AUTHORIZED SALES SERVICE CENTERS

★ AUTHORIZED PARTS SALES & REPAIR SERVICE

★★ PARTS, GENERAL TEST EQUIPMENT & PANEL INSTRUMENT SALES & SERVICE

★★ SAME SERVICE AS (★★) above PLUS AUTHORIZED PANEL INSTRUMENT MODIFICATION

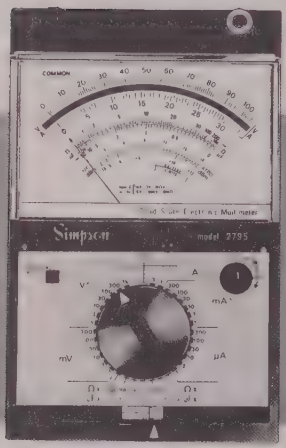
★★	Alabama, Huntsville 35805 Brownell–Electro Inc. 106 Jordan Lane N.W.	Area Code 205 536–2451
★	Alaska, Anchorage R.M. Zook & Associates 1710 East 27th Avenue	Area Code 907 272–6917
★★	Arizona, Phoenix 85034 Metermaster/Phoenix 2633 East Buckeye	Area Code 602 273–7331
★★	California, Glendale 91201 R.V. Weatherford Company 6915 San Fernando Road	Area Code 213 849–3451
★★	California, Los Angeles 90022 Metermaster, Inc. 5646 Jillson Street	Area Code 213 685–4340
★★	California, Palo Alto 94303 Kierulff/Metermaster 3969 East Bayshore Road	Area Code 415 968–6292
★★	California, San Diego 92111 Metermaster/San Diego 8797 Balboa Avenue	Area Code 714 278–2112
★★	California, San Francisco 94105 Pacific Electrical Institute 111 Main Street	Area Code 415 421–7185
★★	Colorado, Denver 80209 Meter Master Instrument Service 1165 South Cherokee	Area Code 303 722–5766
★★	Connecticut, Middletown 06458 The Mancib Company Randolph Road and Coe	Area Code 203 347–5629
★★	Connecticut, New Haven 06511 Kaufman Instrument Lab 810 Dixwell Avenue	Area Code 203 776–7201
★★	Florida, Miami 33136 Florida Precision Instrument Co. 800 N.W. 7th Avenue	Area Code 305 374–1731
★★	Florida, Orlando 32806 Brownell-Electro Inc. 307–27th Street Box 8753	Area Code 305 843–6770

* *	Georgia, Hapeville 30054 Brownell–Electro Inc. P.O. Drawer 730	Area Code 404 762–5181
* *	Hawaii, Honolulu 96819 Electronic Measurement Corp. 2979 Ualena Street	Area Code 870–700
* *	Illinois, Chicago 60648 A & M Instrument, Inc. 6251 West Touhy	Area Code 312 774–3500
* *	Illinois, Oak Park 60300 Pacific Indicator Company 6603 West North Avenue	Area Code 312 261–1330
*	Indiana, Indianapolis 46225 Turner Electronics 18 South New Jersey Street	Area Code 317 639–9169
* *	Kansas, Shawnee Mission 66205 Sturtz Instrument 4705 Mission Road	Area Code 913 236–4705
* *	Kansas, Wichita 67211 Main Electronics, Inc. 363 Pattie	Area Code 316 267–3581
* *	Louisiana, New Orleans Industrial Instrument Works 3305 Tchoupitoulas Street	Area Code 504 895–5621
* *	Maryland, Elkridge 21227 Sunshine Scientific Instrument 5600 Main Street	Area Code 301 796–5600
* *	Maryland, Timonium 21093 E.I.L. Instrument Division 1830 York Road	Area Code 301 252–1260
* *	Massachusetts, Burlington 01803 The Mancib Company Middlesex Turnpike at "A"	Area Code 617 272–9450
* *	Massachusetts, Needham Heights Instruments, Inc. 570 Hillside Avenue	Area Code 617 444–9410
* *	Michigan, Ferndale 48220 Ram Meter, Inc. 1100 Hilton Road	Area Code 313 547–1000
* *	Minnesota, Minneapolis 55247 Instrumentation Services 957 Winnetka Avenue	Area Code 612 544–8916
* *	Missouri, St. Louis 63143 Scherrer Instruments 7170 Manchester	Area Code 314 644–5362

★★★	New Jersey, Belleville 07109 Marshall Instruments Inc. 236 Washington Avenue	Area Code 201 751–1190
★★★	New Jersey, Roselle 07203 E.T. Instrument & Controls 205 Columbus Avenue	Area Code 201 241 8282
★ ★	New York, Buffalo 14216 Electrical Instrument Labs 932 Hertel Avenue	Area Code 716 876–0880
★★★	New York, Great Neck, L.I. 11022 A & M Instrument Labs Community Drive	Area Code 516 487–0330
★ ★	New York, Great Neck, L.I. 11022 Simpson Instrument Sls & Service 130 Cutter Mill Road	Area Code 212 683–0674
★★★	New York, New York 10013 Nilsson Electronic Labs 103 Lafayette Street	Area Code 212 WA5–1730
★★★	New York, New York 10011 E.T. Instrument & Controls Co. 85th Tenth Avenue	Area Code 212 675–2400
★ ★	New York, Syracuse 13215 Syracuse Instrument Lab. 4895 South Avenue	Area Code 315 492–1651
★ ★	New York, Vestal 13850 Compton Industries 413 Commerce Way	Area Code 607 729- 9221
★★★	North Carolina, Charlotte 28206 Brownell-Electro Inc. 5141 Belhaven Blvd. Box #8291	Area Code 704 394–4341
★★★	Ohio, Cleveland 44103 Pioneer–Standard Electronics 5403 Prospect Avenue	Area Code 216 432–0010
★★★	Ohio, Cleveland 44135 Weschler Electric Corporation 4250 West 130th Street	Area Code 216 251–4609
★★★	Ohio, Dayton 45404 Pioneer-Dayton 1900 Troy Street	Area Code 513 236–9900
★ ★	Oklahoma, Tulsa 74120 Agra Engineering Company 551 South Quaker	Area Code 918 582–5754
★ ★	Oregon, Portland 97217 Westcon, Inc. 1910 North Killingsworth Street	Area Code 503 285–6629

★★★	Pennsylvania, Monroeville 15235 E.I.L. Instrument Division 2366 Holliday Park Shopping Center	Area Code 412 327–4450
★★★	Pennsylvania, Philadelphia 19115 Sunshine Scientific Inst. 1810 Grant Avenue	Area Code 215 673–5600
★★★	Pennsylvania, Pittsburgh 15222 Cameradio Company 2801 Liberty Avenue	Area Code 412 391–4000
★★★	Pennsylvania, Pittsburgh 15216 Charles Automatic Controls P.O. Box 10322	Area Code 412 561–6488
★★★	Tennessee, Memphis 38112 Brownell–Electro Inc. 217 Cumberland Street	Area Code 901 323–8554
★★	Tennessee, Memphis 38111 Instrument Repair Service 206 South Cleveland	Area Code 901 278–0762
★★★	Texas, Dallas 75204 Ultra Instrument Lab Inc. 9995 Monroe	Area Code 214 357–0297
★★★	Texas, Garland 75040 Metermaster, Inc. 2815 National Drive	Area Code 214 271–2471
★★★	Texas, Houston 77003 EIMCO Inc. 1602 Missouri	Area Code 713 526–6871 & 72
★★	Texas, Odessa 79760 Meter Service & Supply 2127 Kernit Hwy P.O. Box 2373	Area Code 915 332–0565
★★★	Virginia, Falls Church 22046 E.I.L. Instrument 121 Annadale Road	Area Code 703 532–0166
★	Virginia, Richmond 23224 Instrument Technical Reps. 925 East 4th Street	Area Code 703 231–3035
★★★	Washington, Seattle 98105 Eicher Richards 2727 N.E. Blakely	Area Code 206 523–7888
★★★	Washington, Seattle 98119 The Instrument Lab Inc. 934 Elliott Avenue West	Area Code 206 283–5850
★★★	Wisconsin, Milwaukee 53202 The Electro–Mechano Co. 241 East Erie Street	Area Code 414 272–4050

New SOLID-STATE FET-INPUT MULTIMETER



from SIMPSON *of course*

Model 2795

PORTABLE, LABORATORY ACCURACY, SOLID-STATE ELECTRONIC MULTIMETER

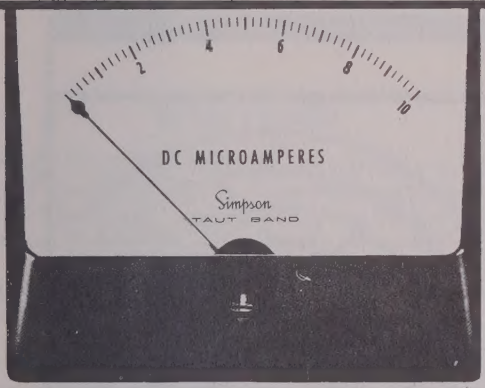
- 68 Switch Selectable Functions:
  - 13 AC and DC Voltage Ranges (as low as 1 MV, full scale)
  - 14 AC and DC Current Ranges (as low as 1 μA, full scale)
  - 6 low power (IC compatible) Resistance Ranges
  - 6 completely self-contained Capacitance Ranges
- **Plus** 12 Output Ranges
- Circuit Breaker Overload Protection
- High FET-Input Impedance
- $\pm$ 1% Accuracy for AC and DC
- Negligible Voltage Drop
- Simple, Straight-Forward Operation
- Size: 8.07" High, 5.04" Wide, 3.94" Deep. Only 3.3 lbs.

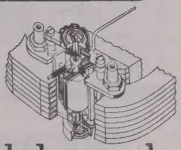
2795 MULTIMETER supplied complete with batteries, test leads and operator's manual. Complete accessories available.

WRITE FOR BULLETIN L-1010 . . . OR CONTACT YOUR SIMPSON INSTRUMENTATION PRODUCTS DISTRIBUTOR FOR OFF-THE-SHELF DELIVERY

Simpson
INSTRUMENTS THAT STAY ACCURATE

SIMPSON ELECTRIC COMPANY
5200 W. Kinzie Street, Chicago, Illinois 60644
Phone (312) 379-1121
EXPORT DEPT.: 400 W. Madison St, Chicago, Ill 60606. Cable Simelco
IN CANADA: Bach-Simpson Ltd., London, Ontario
IN INDIA: Ruttonsha-Simpson Private Ltd., International House, Bombay-Agra Road, Vikhroli, Bombay





here's the taut band reliability you should demand

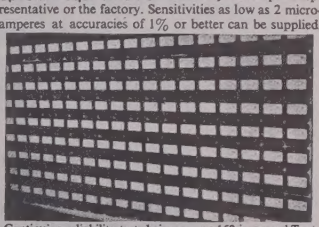
Simpson's search for reliability began at a major source of trouble—the overly complicated design of conventional Taut Band suspensions. The result was an improved suspension with 25% fewer parts.

Because of this, you would expect life expectancy to zoom, and trouble to nose dive. And that's just what happened.

The Ultimate in Test Programs—As just one step in a comprehensive test program to insure reliability measuring up to today's needs, Simpson engineers put 150 of the improved Taut Band meters on a continuing 24-hour test (cycled zero to full scale 2200 times per hour). As of August 30, 1964, the 150 meters have logged 25,243,000 cycles without failure. This is equivalent to over 70 years of normal operation. Weekly calibration checks show that the meters are holding ± ½% accuracy. Simpson Taut Band meters also passed ASA tests for extreme temperature, humidity, shock, and vibration.

Stocked for Immediate Delivery—Present units stocked are microammeters in 2½″, 3½″, and 4½″ sizes. Ranges are 10, 15, 25, 50, 100 ua; accuracy, ± 2% F.S. *For fast service, call your distributor.*

Special Requirements—Contact your Simpson representative or the factory. Sensitivities as low as 2 microamperes at accuracies of 1% or better can be supplied.



Continuing reliability tests being run on 150 improved Taut Band meters with 20 pivot-jewel meters used as control units.

WRITE FOR Bulletin PM-505.

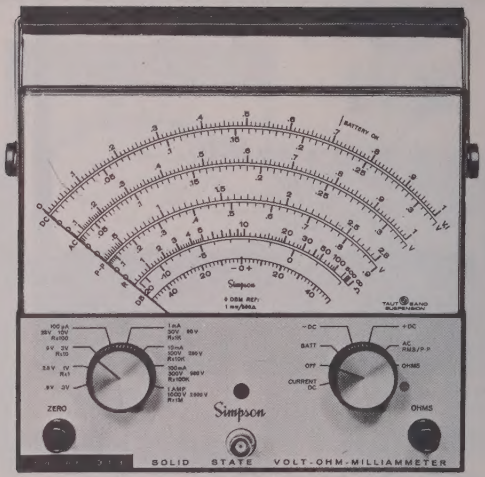
Simpson

DIVISION

Representatives in Principal Cities ...See Telephone Yellow Pages

SIMPSON ELECTRIC COMPANY
5202 W. Kinzie Street, Chicago, Illinois 60644 • Phone: (312) EStebrook 9-1121
California: Simpson Instruments, Inc., P.O. Box 488, 1130 Simpson Way, Escondido, Calif. • Phone: (714) SH 5-8202
In Canada: Bach-Simpson Ltd., London, Ontario
In India: Ruttonsha-Simpson Private Ltd., International House, Bombay-Agra Road, Vikbrail, Bombay

INSTRUMENTS THAT STAY ACCURATE



Simpson's NEW solid-state VOM with FET-Input

- **HIGH INPUT IMPEDANCE...**
  11 Meg Ω DC 10 Meg Ω AC
- **PORTABLE..... battery operated**
- **7-INCH METER.....overload protected**

Simpson's new 313 gives you high input impedance for accurate testing of latest circuit designs . . . free of line cord connections. Over 300 hours operation on inexpensive batteries. And the new 313 is *stable*, which means positive, simplified zero and ohms adjustments. Protected FET-input handles large overloads. DC current ranges to 1000 mA. Sensitive Taut Band movement and 7-inch meter scale provide superior resolution down to 5 millivolts. Write today for complete specifications.

Complete with batteries, 3-way AC-DC-Ohms probe and operator's manual

GET "OFF-THE-SHELF" DELIVERY FROM YOUR LOCAL ELECTRONIC DISTRIBUTOR

Simpson ELECTRIC COMPANY

AGM DIVISION

5200 W. Kinzie Street, Chicago, Illinois 60644 • Phone (312) 379-1121

Warranty

SIMPSON ELECTRIC COMPANY warrants each instrument and other articles of equipment manufactured by it to be free from defects in material and workmanship under normal use and service, its obligation under this warranty being limited to making good at its factory any instrument or other article of equipment which shall within 90 days after delivery of such instrument or other article of equipment to the original purchaser be returned intact to it, or to one of its authorized service stations, with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on its part, and SIMPSON ELECTRIC COMPANY neither assumes nor authorizes any other persons to assume for it any other liability in connection with the sale of its products.

This warranty shall not apply to any instrument or other article of equipment which shall have been repaired or altered outside the SIMPSON ELECTRIC COMPANY factory or authorized service stations, nor which has been subject to misuse, negligence or accident, incorrect wiring by others, or installation or use not in accord with instructions furnished by the manufacturer.

Simpson ELECTRIC COMPANY
5200 W. Kinzie Street, Chicago, Illinois 60644 Phone: (312) 379-1121
Export Dept: 400 W. Madison Street, Chicago, Illinois 60606, Cable, Simelco
IN CANADA: Bach-Simpson Ltd., London, Ontario
IN INDIA: Ruttonsha-Simpson Private Ltd., International House, Bombay-Agra Road, Vikhroli, Bombay

AGM DIVISION

Quality is the indispensable component
of every Simpson instrument . . . . . .